Electromagnetic Radiation Safety

Scientific and policy developments regarding the health effects of electromagnetic radiation exposure from cell phones, cell towers, Wi-Fi, Smart Meters, and other wireless technology

Wednesday, September 7, 2016

National Toxicology Program Finds Cell Phone Radiation Causes Cancer

September 7, 2016

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HEALTH ISSUES | National Toxicology Program Report on Cancer Risk from Cellphone Radiation

The Green Gazette published an article today about the National Toxicology Program cell phone radiation study based upon my June 10 post which appears below.

http://www.thegreengazette.ca/health-issues-national-toxicology-program-report-on-cancer-risk-from-cellphone-radiation-2/

August 23, 2016

Presentation on NTP Study to NIEHS Board of Scientific Counselors

On June 15, Dr. Michael Wyde, the director of the cell phone radiation studies conducted by the National Toxicology Program (NTP), provided an overview of the studies to the Board of Scientific Counselors of the National Institute of Environmental Health Sciences (NIEHS). He summarized the research designs and the partial results for the toxicology and carcinogenicity studies.

A video of the presentation including the presentation slides and the question and answer session is available at https://youtu.be/TCRF71eMZ1Q.

According to Dr. Wyde, the FDA recommended that the NTP conduct toxicology and carcinogenicity studies of cell phone radiation in 1999. Completion of these studies is expected by some time in 2018.

June 24, 2016

According to the National Institute of Environmental Health Sciences, the newly-released study on cellphone radiation and cancer in rats conducted by the National Toxicology Program (NTP) resulted in more than 1,000 news stories. Nearly 150 reporters participated in the telephone press conference held by the NTP on May 27.

Unfortunately, much of the media coverage contained considerable bias, or "spin" intended to create doubt about the study's important findings regarding cancer risk from exposure to cellphone radiation. Notable exceptions included news stories that appeared in the *Wall Street Journal* and *Mother Jones*.

June 10, 2016

NTP Toxicology & Carcinogenicity Cell Phone Radiofrequency Radiation Studies

Summary of Presentation at BioEM 2016 Meeting (Ghent, Belgium) by Michael Wyde, PhD, Director of NTP Studies of Cell Phone Radiation, NIEHS, June 8, 2016

Dr. Wyde explained the four reasons why the National Toxicology Program (NTP) decided to release partial study results at this time: 1) given widespread cellphone use, even a small increase in disease incidence could have major public health implications; 2) there is a high level of public and media interest in the study; 3) the tumor types observed in these studies are similar to those found in human studies of cellphone use; and 4) the results support the IARC classification of radiofrequency radiation as potentially cancer-causing in humans.

Dr. Wyde discussed the 5-day pilot studies conducted on young and aged mice and rats and on pregnant rats to determine the maximum intensity of cellphone radiation that could be employed in the subsequent studies without inducing any heating effect. He also described the 28-day pre-chronic toxicology studies and the 2-year toxicology and carcinogenicity studies.

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For the pre-chronic studies, NTP selected SAR exposures of 0, 3, 6, and 9 watts/kilogram (W/kg) in rats and 0, 5, 10, and 15 W/kg in mice based on pilot study results. Pregnant rats were exposed prenatally and 28 days postnatal to 900 MHz cellphone radiation (GSM or CDMA). Five-week old mice were exposed to 1900 MHz cellphone radiation for 28 days.

Dr. Wyde reported **statistically significant evidence of DNA damage from nonthermal exposure to cellphone radiation in mice as well as in rats:**

- male rats: frontal cortex, hippocampus, liver, blood
- male mice: frontal cortex
- female rats: frontal cortex
- female mice: liver, blood

The partial results of the carcinogenicity studies were also discussed. See my summary below.

The slides for this presentation are available at:
http://ntp.niehs.nih.gov/ntp/research/areas/cellphone/slides_bioem_wyde.pdf

June 13, 2016

Do Cellphones Cause Cancer? Probably, but it's Complicated
Dr. Chris Portier, Scientific American Blog, Jun 13, 2016

Setting the Record Straight on NTP Cell Phone Cancer Study
Dr. Ron Melnick Corrects 'Misinformation,' Rebuffed by the New York Times
Microwave News, Jun 10, 2016

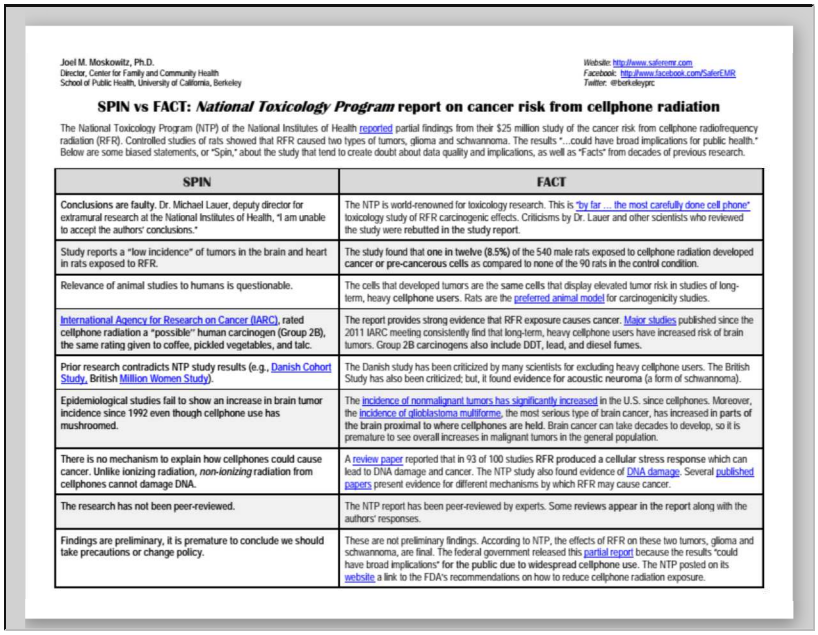
May 30, 2016

SPIN vs FACT: *National Toxicology Program* report on cancer risk from cellphone radiation

The National Toxicology Program (NTP) of the National Institutes of Health reported partial findings from their $25 million study of the cancer risk from cellphone radiofrequency radiation (RFR). Controlled studies of rats showed that RFR caused two types of tumors, glioma and schwannoma. The results "…could have broad implications for public health."

A fact sheet on the NTP study that summarizes some biased statements, or "Spin," about the study that tend to create doubt about data quality and implications, as well as "Facts" from decades of previous research is available at http://bit.ly/NTPspinfacts.

A German translation of this fact sheet is available at diagnose:funk.



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SPIN	FACT
Conclusions are faulty. Dr. Michael Lauer, deputy director for extramural research at the National Institutes of Health, "I am unable to accept the authors' conclusions."	The NTP is world-renowned for toxicology research. This is "by far … the most carefully done cell phone" toxicology study of RFR carcinogenic effects. Criticisms by Dr. Lauer and other scientists who reviewed the study were rebutted in the study report.
Study reports a "low incidence" of tumors in the brain and heart in rats exposed to RFR.	The study found that **one in twelve (8.5%)** of the 540 male rats exposed to cellphone radiation developed **cancer or pre-cancerous cells** as compared to none of the 90 rats in the control condition.
Relevance of animal studies to humans is questionable.	The cells that developed tumors are the same cells that display elevated tumor risk in studies of long-term, heavy **cellphone users**. Rats are the preferred animal model for carcinogenicity studies.
International Agency for Research on Cancer (IARC), **rated cellphone radiation a "possible" human carcinogen (Group 2B), the same rating given to coffee, pickled vegetables, and talc.**	The report provides strong evidence that RFR exposure causes cancer. Major studies published since the 2011 IARC meeting consistently find that long-term, heavy cellphone users have increased risk of brain tumors. Group 2B carcinogens also include DDT, lead, and diesel fumes.
Prior research contradicts NTP study results (e.g., Danish Cohort Study, British Million Women Study).	The Danish study has been criticized by many scientists for excluding heavy cellphone users. The British Study has also been criticized; but, it found evidence for **acoustic neuroma** (a form of schwannoma).
Epidemiological studies fail to show an increase in brain tumor incidence since 1992 even though cellphone use has mushroomed.	The incidence of nonmalignant tumors has significantly increased in the U.S. since cellphones. Moreover, the incidence of glioblastoma multiforme, the most serious type of brain cancer, has increased in **parts of the brain proximal to where cellphones are held.** Brain cancer can take decades to develop, so it is premature to see overall increases in malignant tumors in the general population.
There is no mechanism to explain how cellphones could cause cancer. Unlike *ionizing* radiation, *non-ionizing* radiation from cellphones cannot damage DNA.	A review paper reported that in 93 of 100 studies **RFR produced a cellular stress response** which can lead to DNA damage and cancer. The NTP study also found evidence of DNA damage. Several published papers present evidence for different mechanisms by which RFR may cause cancer.
The research has not been peer-reviewed.	The NTP report has been peer-reviewed by experts. Some reviews appear in the report along with the authors' responses.
Findings are preliminary, it is premature to conclude we should take precautions or change policy.	These are not preliminary findings. According to NTP, the effects of RFR on these two tumors, glioma and schwannoma, are final. The federal government released this partial report because the results "could have broad implications" **for the public due to widespread cellphone use.** The NTP posted on its website a link to the FDA's recommendations on how to reduce cellphone radiation exposure.

May 27, 2016 (updated June 1)

On May 26, the National Toxicology Program (NTP) of the National Institutes of Health issued the first in a series of reports that contains partial findings from their long-awaited, $25 million study of the cancer risk from cell phone radiation. This report summarizes the study of long-term exposure to cell phone radiation on rats. The report on mice will be issued at a later date.

According to the report:

> "Given the widespread global usage of mobile communications among users of all ages, even a very small increase in the incidence of disease resulting from exposure to RFR [radiofrequency radiation] could have broad implications for public health."

Overall, thirty of 540 (5.5%), **or one in 18 male rats exposed to cell phone radiation developed cancer**. In addition,16 pre-cancerous hyperplasias were diagnosed. Thus, 46 of 540, or **one in 12 male rats exposed to cell phone radiation developed cancer or pre-cancerous cells** as compared to none of the 90 unexposed male rats.

The two types of cancer examined in the exposed rats were glioma and schwannoma. Both types have been found in human studies of cell phone use.

In the group exposed to the **lowest intensity of cell phone radiation** (1.5 watts/kilogram or W/kg), 12 of 180, or **one in 15 male rats** developed cancer or pre-cancerous cells. In the **highest exposure** group (6 W/kg), 24 of 180, or **one in 8 male rats** developed cancer or pre-cancerous cells.

This latter finding has policy implications for the FCC's current cell phone regulations which allow cell phones to emit up to 1.6 W/kg at the head or near the body (partial body Specific Absorption Rate or SAR).

The NTP study is likely a **"game-changer"** as it proves that non-ionizing, radiofrequency radiation can cause cancer without heating tissue.

The results of the study reinforce the need for more stringent regulation of radiofrequency radiation and better disclosure of the health risks associated with wireless technologies -- two demands made by the **International EMF Scientist Appeal** -- a petition signed by 220 scientists who have published research on the effects of electromagnetic radiation.

Along with other recently published studies on the biologic and health effects of cell phone radiation, the International Agency for Research on Cancer of the World Health Organization should now have sufficient data to reclassify radiofrequency radiation from "possibly carcingogenic" to "probably carcinogenic in humans."

The risk of cancer increased with the intensity of the cell phone radiation whereas no cancer was found in the sham controls—rats kept in the same apparatus but without any exposure to cell phone radiation.

In contrast to the male rats, the incidence of cancer in **female rats** among those exposed to cell phone radiation was not statistically significant. Overall, sixteen of 540 (3.0%), or **one in 33 female rats exposed to cell phone radiation developed cancer or a pre-cancerous lesion** as compared to none of the 90 unexposed females. The NTP provided no explanation for the sex difference. The researchers pointed out that none of the human epidemiology studies has analysed the data by sex.

Why did cellphone radiation significantly increase cancer risk in male but not female rats? Perhaps, because glioma and heart schwannoma are less common in females. According to Microwave News (6/1/2016), the NTP report shows that among controls from past toxicology studies, males were ten times more likely to develop glioma than female rats (11 of 550 vs. 1 of 540). Also, males were twice as likely to develop heart schwannoma than female rats (9 of 669 vs. 4 of 699).

The researchers believe that the cancers found in this experimental study were caused by the exposure to cell phone radiation as none of the control animals developed cancer. The researchers controlled the temperature of the animals to prevent heating effects so the cancers were caused by a **non-thermal mechanism.**

One of two types of second-generation (2G) cell phone technology, GSM and CDMA, were employed in this study. The frequency of the signals was 900 MHz. The rats were exposed to cell phone radiation every 10 minutes followed by a 10-minute break for 18 hours, resulting in nine hours a day of exposure over a two-year period. Both forms of cell phone radiation were found to increase cancer risk in the male rats.

For each type of cell phone radiation, the study employed four groups of 90 rats -- a sham control group that was not exposed to radiation, and three exposed groups. The lowest exposure group had a SAR of 1.5 W/kg which is within the FCC's legal limit for partial body SAR exposure (e.g., at the head) from cell phones. The other exposure groups had SARs of 3 and 6 W/kg.

Glioma is a common type of brain cancer in humans. It affects about 25,000 people per year in the U.S. and is the most common cause of cancer death in adults 15-39 years of age. Several major studies have found increased risk of glioma in humans associated with long-term, heavy cell phone use.

In humans, schwannoma is a nonmalignant tumor that grows in Schwann cells that cover a nerve which connects to the brain. Numerous studies have found an increased risk of this rare tumor in heavy cell phone users. In the rat study, malignant schwannoma was found in Schwann cells in the heart.

The FDA requested in May, 1999 that the NIEHS research the effects of cell phone radiation on DNA in animal models. FDA called this a "high priority." Seventeen years later the NIEHS has released only partial results from a series of studies which should have taken only a few years to conduct.

For more information about the NTP study see http://bit.ly/govtfailure.

For references to the research that found increased risk of malignant and nonmalignant tumors among long-term cell phone users see http://bit.ly/WSJsaferemr.

The NTP report is available at http://bit.ly/NTPcell1.

Labels: Bucher, cancer, cell phone radiation, game-changer, glioma, mice, National Toxicology Program, NIEHS, NIH, NTP Study, rats, report, schwannoma, Wyde

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